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Response to Final action mailed 04/06/2005

Remarks**Alleged Anticipation under 35 USC 102(b)**

It is noted that the Examiner has rejected claim 1 under 35 USC(102)b as anticipated by Ohja. In order to meet the test of anticipation, it is essential that:

"each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

The Federal Circuit has also stated:

"An anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed and that its existence was recognized persons of ordinary skill in the field of the invention". *ATD Corp. v. Lydall, Inc.*, 48 USPQ 2d 1321.

Not only must the prior art contain all the elements of the claim in order to constitute an anticipation, the elements must be "*arranged as in the claim*". *Lindemann Maschinenfabrik GmbH v American Hoist & Derrick Co.* 221 USPQ 481.

In the applicant's respectful submission, when the above requirements are taken into consideration and Ohja is properly interpreted, the Examiner's allegation of anticipation does not stand up to scrutiny. Ohja does not disclose, either expressly or inherently, each and every element of claim 1 as expressly required by the caselaw.

Firstly, it is noted that claim 1 expressly states that the recited steps are carried out in sequence. The examiner alleges on page 8 of the Office Action that changes in sequence do not generally lead to a patentable invention. While the applicant's respectfully disagree with this general statement (changes in sequence may or may not have a dramatic effect depending on the facts) for reasons to be explained in more detail below, such an assertion relates to obviousness, not to anticipation. If a claim clearly sets forth a sequence, and the prior art discloses a different sequence, the prior art cannot represent an anticipation under 35 USC 102(b) because it cannot

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be said to clearly teach the invention claimed. Any objection must fall under 35 USC 103(a), not 35 USC 102(b). Such objection will be addressed later.

Clearly, Ohja does not teach two thermal treatments lasting longer than 30 minutes (In fact, he teaches the opposite), and for this reason alone, Ohja cannot be regarded as an anticipation under 35 USC 102(b) in accordance with the caselaw noted above. This allegation of the Examiner is therefore respectfully, but forcefully, traversed.

One of the fundamental tenets of interpretation of prior art is that it must be fairly read as a whole to determine what it actually teaches. It is not permissible to pick and choose stray phrases within a reference and assemble them out of context in order to arrive at the invention claimed." The totality of a reference's teachings must be considered" *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1550-51, 220 USPQ 303, 311 (Fed. Cir. 1983). For example, the Examiner alleges that Ohja teaches a thermal treatment of at least 30 minutes in view of the passage at col. 1, lines 25 – 40. In the applicant's respectful submission this is an inaccurate representation of the teachings of Ohja. In the passage referred to, Ohja is discussing the prior art relative to his invention. In this discussion, Ohja teaches that annealing times of several hours are employed in the prior art and goes on to consider long anneal times a disadvantage of this prior art. In particular, at col. 2, line 28, Ohja states that "the invention aims to reduce annealing times, which by many prior art proposals could amount to several hours, and to improve the effective optical quality of waveguide structures ... Specifically, the use of a two-stage process ... significantly reduces the total time required to provide effective annealing" (emphasis added). Thus, Ohja contrasts his novel two-stage process, which requires significantly reduced anneal times, with the prior art (by implication involving a single-stage anneal), which requires longer anneal times. To assert that Ohja teaches a two-stage process with anneal times in excess of 30 minutes (The longest time Ohja appears to teach is 300 seconds (5 minutes for each stage) – see also claims 2 and 3) is clearly not a fair representation of his teaching.

Moreover, Ohja that one of the problems with the prior art anneal processes was that they caused cracking of the deposited cladding layer (col. 1, line 33). Since the cladding layer is deposited last, the anneal process contemplated by Ohja in the prior art must clearly take place after the deposition of the cladding layer by contrast to the invention, where the cladding layer is

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deposited after the two-stage thermal treatment process, and wherein the core layer is deposited between the two stage of the thermal treatment process.

With regard to step *d*, the Examiner alleges that the "ramping steps are taught or necessarily inherent as are long annealing times". It is not understood how the Examiner can state that long annealing times are "necessarily inherent" when Ohja expressly teaches that the object of his invention is to reduce annealing times ("The invention aims to reduce annealing times" col. 2, line 28). Such an allegation appears to be in flat contradiction of the express teachings of Ohja. If the Examiner chooses to issue a negative advisory action, for the purposes of clarifying the issues for appeal and given the *prima facie* teaching of Ohja to use short annealing times, the Examiner is expressly requested to indicate how he considers "long annealing times" to be inherent in the teachings of Ohja.

The Examiner refers to col. 4, lines 25 – 29 as allegedly disclosing long anneal times. Again, this passages is comparing the novel two-stage Ohja invention to the prior art. The entire passage has to be read in context. What is says is that "It will be appreciated that the total anneal time for a wafer having a buffer, core and stress compensating layers, is reduced from the tens of hours for annealing in convention resistively heated furnaces, to one or two minutes when carried out by the above rapid thermal annealing." This passage compares the Ohja invention, which teaches the two-stage process whose object is to reduce annealing times to the prior art where long annealing times were employed. In the applicant's respectful submission, it is grossly unfair to the applicant to interpret this passage as clearly teaching a two-stage process wherein the anneal times are long. Ohja teaches that in accordance with the prior art, a long anneal time was required, but in accordance with his inventive two-stage process short anneal times, of one or two minutes, and certainly less than 5 minutes, should be employed.

The Examiner's statement at the top of page 3 that the limitations of decreasing stress etc. are inherent result "because Ohja does the same thing the applicant does" is clearly incorrect because Ohja does the opposite of what the applicant does. Ohja teaches short anneal times of less than 300 seconds in contrast to the applicant's anneal times of greater than 1800 seconds, which are necessary to achieve the stated results. So it does not follow that the stress relief steps defined would result from following the teachings of Ohja.

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It is also very important to note the applicant's sequence of steps involve stress relieving the buffer layers before depositing the core layer, and then carrying out the second thermal treatment after deposition of the core layer. Ohja does not teach this. The Examiner refers to the rather vague statement at col. 2, lines 17 – 20 that the "invention is concerned with annealing the buffer layer, or annealing both this and the core layer, before the cladding layer is added" as suggesting heat treatment before adding the core layer. Ohja's teaching is of an anneal process that takes place of a single anneal. Ohja teaches an anneal process that takes place in two stages, one after the other, but after a careful review of Ohja the applicant is not able to find any teaching of a two-stage anneal process, as more particularly defined in claim 1, wherein the core layer is deposited between the anneal steps, and wherein each step is carried out for at least 30 minutes.

To summarize:

Ohja notes that in the prior art anneal to Ohja times of several hours were required (col. 1, line 27), and indicates in accordance with his inventive process that "specifically, the use of a two-stage process ... reduces the total time to provide effective annealing" (col. 2, line 35), and in the examples described discloses an anneal time for each stage not exceeding 300 seconds ("typically 30 to 300 seconds" (e.g. col 4, line 7). By no stretch of the imagination can this be regarded as a "clear teaching" to use a two-stage anneal (ignoring for the moment the other claim limitations), wherein each anneal stage exceeds 30 minutes (1800 seconds), which is 6 times the upper limit noted in Ohja, especially when Ohja makes it clear throughout that the long anneal times are a disadvantage and the stated object of Ohja is to reduce anneal times.

Since Ohja uses short anneal times, and therefore a different process from the invention, the stress relief steps cannot be considered inherent because Ohja does not teach the same process as the invention.

Ohja therefore teaches two approaches:

- 1) a prior art approach wherein a single anneal for several hours is performed after deposition of the cladding layer;
- 2) a novel approach wherein a two-stage process is employed, which uses short anneal times, i.e. less than 300 seconds each.

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To mix the two processes would be in direct contravention of the express teachings of Ohja.

Alleged obviousness under 35 USC 103(a)

Firstly, with regard to the Examiner's assertion that changes in sequence are *prima facie* obvious, such a position has to be viewed with a reasonable degree of common sense. Obviously, if ingredients are merely mixed together without interacting in any way, changing the sequence will not have any affect on the outcome. On the other hand, if someone discovers, for example, that two of the ingredients combine when mixed to form a third ingredient, and if this third ingredient when mixed with the remaining ingredients produces some advantageous and unexpected result, no-one would suggest that changing the sequence would be inherently unpatentable.

In the present case, it clearly makes a difference whether one heats the entire structure in one stage, or heats part of the structure in a first stage and another part in the second stage. For example, in the Ohja prior art, the annealing step causes cracking of the cladding layer. Clearly, if the annealing steps takes place prior to the deposition of the cladding layer, such cracking cannot take place. In the present invention, it is important to carry out the steps in a particular sequence to get the desired degree of stress relief, both compressive and tensile, at the various stages in the process (see Figure 10), and changing the order of the treatment steps fundamentally changes the nature of the process and the stress relief so that the process will no longer result in good quality waveguides.

To dismiss the sequence as being equivalent to coating a laminated sheet where it makes no difference what order the steps are carried out in is unreasonable and not a realistic assessment of the situation as it would be understood by one skilled in the art. The art of waveguide processing is crowded and small changes process sequence can introduce significant results in the final product.

Examiners frequently rely on the latent properties argument in situations, where in the applicant's submission, it is wholly inappropriate to do so. In almost every instance, when called upon to rule on obviousness, the CAFC starts by analyzing the problem addressed by the inventor. The cases relied on by the Examiner relate to clear cut cases where the alleged

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invention really was trivial over the prior art and the applicant was seeking to rely on some hitherto unknown advantage of the prior art, introduced almost as an afterthought in an attempt to justify an otherwise obvious invention. These cases also have to be reconciled with *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995) ("One way for a patent applicant to rebut a *prima facie* case of obviousness is to make a showing of 'unexpected results,' i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected."), cited with approval in *In re Glaug*, 62 USPQ2d 1151 (CA FC 2002).

In *In re Ohiaya*, the court stated clearly that the prior art had to suggest the invention. In this case, the difference over the primary reference was the use of a labyrinth heater. The prior art clearly suggested the use of a labyrinth heater because they had the advantage that the samples were maintained at a uniform temperature. The applicant argued that they also resulted in an expected advantage that they had shorter response times, but the court held that it was inherently obvious to use such heaters and the discovery of an additional advantage did not change that position.

In order for an objection of *prima facie* obviousness to stand, there has to be a clear suggestion in the prior art, which has to be analogous art, to practice the invention claimed. This cannot be the case in the present instance since Ohja clearly teaches away from the invention for the reasons stated in some detail above. The Examiner's assertion at the foot of page 5 that it would have been obvious to heat the structure for several hours "if one does not have access to a rapid thermal annealing device" does not stand up to scrutiny because as noted the conventional process envisaged by Ohja only contemplated a single anneal after deposition of the cladding layer. Thus, if one did not have access to a rapid thermal anneal device, the conclusion is that one would not be able to practice the method of Ohja and one would have to practice the method of the prior art with its resultant cracking problems. One can't pick and choose. It makes no sense, when Ohja teaches the use of a two-stage process involving a rapid thermal anneal with the object of reducing the thermal anneal time to assert that in pointing out the advantage of his two-stage process over the prior art, Ohja somehow teaches a two-stage process employing prior art heating. Ohja teaches one or other process, not a carefully selected (and incompatible)

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combination of the two. It is not sufficient that one *could* modify Ohja, but whether one *would* do so (see *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.* 43 USPQ 2d 1294. Clearly, one would not do so if the teaching of Ohja is to the contrary.

A reference that teaches away from an invention cannot render it *prima facie* obvious. As noted in *In re Gurley* (CA FC) 31 USPQ2d 1130 that "[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant". Clearly, Ohja teaches using short anneal times, and this inherently is teaching away from the longer times employed in the invention, but which by implication did not involve a two-stage anneal process. There is no suggestion that the prior art envisaged by Ohja employs a two-stage process, and on the contrary Ohja uses this two-stage process as a point of novelty over the prior art (see claim 1).

The applicants have addressed the Examiner's specific objections with regard to claim 1, which is believed patentable.

A detailed discussion of the invention was given in the previous response, and it is not proposed to repeat it. Suffice it to say that Ohja clearly does not disclose the particular sequence necessary to obtain good quality waveguides applying the principles described with reference to Figure 10.

With regard to the Examiner's rebuttal of the applicant's arguments, it is pointed out that the invention is based on an analysis of the thermal stresses arising during the deposition of the various layers as more particularly discussed with Figure 10, and in particular a recognition that the stresses go through different stages from compressive to tensile, and that by carrying out the steps claimed good quality low stress products can be obtained. It is believed there is ample evidence in the specification to support such a claim, particularly having regard to the prior art, which for the reasons noted, fails to disclose or suggest the steps set forth.

It is believed that the remaining claims derive their patentability at least from claim 1, and it is not proposed to discuss them further in detail at this point.

The Examiner is therefore respectfully requested to reconsider the final rejection, and reconsideration and allowance are therefore respectfully requested.

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